E-money and communities of payments

Monnaie électronique et communautés de paiements

Olivier Hueber

Université de Nice – Sophia Antipolis/ GREDEG – CNRS

olivier.hueber@unice.fr

RESUME

De nouvelles modalités de paiement électroniques (tels que Paypal) ainsi que de nouvelles quasi-monnaies électroniques (tels que les Linden Dollars, les Smiles ou les Maximiles) connaissent aujourd'hui un essor considérable. Dans une première partie, cet article examine comment il est aujourd'hui possible de constituer une épargne en ligne sans que les autorités fiscales et monétaires en soient informées et comment créer anonymement de la monnaie électronique. La deuxième partie examine l'émergence de nouvelles communautés de paiements électronique. Ces communautés ont leurs règles de comportement propres que la littérature standard sur la monnaie et la finance a des difficultés à appréhender.

ABSTRACT

This article examines which are the potential ways to settle transactions by going off the official public e-money. By focussing in particular on the PayPal's and Linden Dollars services, it stresses firstly on the impact of new forms of electronic payments on the banking system. Studying such an impact allows us to spotlight the money creation function held by banks. Secondly, this paper shows that new nearly e-monies promote the emergence on new communities of payment with all the consequences traditionally observed in any community namely network externalities and transaction costs.

MOTS CLES: INTERNET, MONNAIE, PAIEMENTS ELECTRONIQUES, MONNAIE ELECTRONIQUE, BANQUES.

KEYWORDS: INTERNET, MONEY, ELECTRONIC PAYMENTS, BANKING, ELECTRONIC MONEY

1. Introduction

The usual electronic money (e-money), in particular those transmitted by our usual credit card, does not change the way how the money is used and how the quantity is money is regulated by the public monetary authorities[1]. This kind of money is typically qualified as public money or central money. In the last few years, several new technologies of payment have progressively started to threaten the monopoly of nations of issuing public money. By the Internet network, it would be possible to purchase goods or services by remaining anonymous from the public banking system. Such possibilities would have heavy consequences. David Chaum founded DigiCash in 1990, an electronic cash company issuing electronic banknotes called *cyber-bucks*. Buy using the blind digital signature invented by David Chaum it became possible to use e-money in the same way that we use a paper banknote that is anonymously. In the last decade of the 20th century, many economists, following the example of Benjamin Friedman, argued that technology in the form of electronic money (e-money) might render central banks obsolete. Moreover, the anonymous e-banknote could be issued by any private institution which is impossible with a paper banknote.

Faced with the threatens of potential new private e-money, banks made pressure on the European Commission to legislate in the aim of protecting the public character of the money and to preserve their seigniorage revenues.

In the Europe, the regulation 2002-13 of 21 November 2002 prevented any one to issue e-money outside the European interbank system. However, the development of the e-commerce is so rapid than the temptation to use anonymous ways of payment is, for many reasons, very strong for many e-buyers and e-sellers.

This article examines which are the potential ways to settle transactions by going off the official public e-money. By focussing in particular on the PayPal's and Linden Dollars services, it stresses firstly on the impact of new forms of electronic payments on the banking system. Studying such an impact allows us to spotlight the money creation function held by banks. Secondly, this paper shows that new nearly e-monies promote the emergence on new communities of payment with all the consequences traditionally observed in any community namely network externalities and transaction costs.

[1] *Electronic money* is broadly defined as an electronic store of monetary value on a technical device that may be widely used for making payments to undertakings other than the issuer without necessarily involving bank accounts in the transaction, but acting as a prepaid bearer instrument (European Central Bank, 1998, p.7).

2. The potential anonymous and private character of the e-money:

The Internet network makes possible the emergence of private electronic money (e-money). A truly private, e-money originates outside the government and outside the banking system. For the moment, all of the new e-money that has been created on the Internet is actually government e-money.

It can be possible to transfer funds anonymously with the *paypal* system. Nowadays, over than 100 millions of accounts are open in the paypal website[2]. It is possible to receive money while remaining anonymous. A simple e-mail address is sufficient for selling and buying. PayPal lets shop without sharing financial information. Obviously, it is easier to hide money from the government by using the paypal system. However, if you have a non-verified status on your paypal bank account you are limited in your payments. It is impossible to pay more than 1500, 00 €. Such a limit of payment can be crossed by creating, still anonymously numerous paypal accounts (see annex 1).

The amount of money circulating from a paypal account to another is still central money, not private money, but can stay anonymous like any paper banknote.

Anonymity in transaction is something that buyers and sellers often want. Forms of electronic money can providing anonymity but still rely on trust between the parties.

In the United Kingdom, it is possible, to buy a prepaid Mastercard called Cashplus without informing your bank. A simple driving licence or a passport is sufficient to buy the Cashplus prepaid card[3]. With such a card, the buyer is not anonymous but, like any paper banknote, the money can circulate apart from the banking system.

Several online resources allow residents of Second Life to convert Linden Dollars into US Dollars and vice-versa[4]. Rates fluctuate based on supply and demand, but over the last few years they have remained fairly stable at approximately 250 Linden Dollars (L$) to the US Dollar. It is also possible to make money in Second Life but such a money is not generated by private players of the game. All the money circulating in Second Life comes originally from the “real” Central Banks. Nevertheless, players earning Linden Dollars during the game avoid the official taxation on profits.

[2] www.paypal.com
[3] http://www.mycashplus.co.uk
[4] www.secondlife.com

Whether it is in the Paypal, the Linden or the Cashplus electronic payment, system, the e-money circulates temporarily outside the official interbank system. We can observe that, the main effect of the private e-banking is a permanent decrease in money demand and consequently in the Central Banks reserves (see annex 2 for demonstration).

If the central bank reserves decrease, the power of central bank to influence economic activities will increasingly weaken.

The decrease in money demand due to the spreading of the e-money can be studied by using the Baumol-Tobin framework. Such a framework direct attention to the transaction costs of moving in and out money substitutes. The "shoe-leather" metaphor – the real costs of too many trips to the bank or broker- stems directly from it.

The Internet e-money permit a reduction in transaction costs (the "shoe leather cost"). Consequently, on one side, the interest elasticity of money demand increase and on the other side there is a permanent decrease in money demand. We can illustrate these macroeconomic effects by using the standard IS-LM model.

By using the Fullenkamp and NSouli (2004) methodology we set up the following analytical example of the consequences of the e-money on the money market. This example shows that the e-money shift downward and flatter the LM curve and therefore decrease the interest rate.

The balances on the market of the goods and services (1) and on the money market (2) are:

$$Y = C+I+G+X-M \quad (1)$$

$$O_m = L_1(Y) + L_2(r) \quad (2)$$

$C = cY + C_0$ (3)	$M = mY + M_0$ (5)	$C_0 = 4$
$I = -gr + I_0$ (4)	$g = 0.2$	$G = 2$
$L_1(Y) = \alpha Y$ (6)	$c = 0.3$	$\alpha = 0,8$
$L_2(r) = -\beta r$ (7)	$I_0 = 1$	$\beta = 0,2$
	$O_m = 1$	$M_0 = 3$
	$m = 0,5$	$X = 0$

Y = GDP, g = marginal propensity to invest, c = marginal propensity to consume, G = public expenses, I_0 = autonomous investment, r = interest rate, C_0 = autonomous consumption, O_m = Money supply, X = exports, M_0 = autonomous imports (for the final consumption), m = marginal propensity to import. α = interest elasticity on the transaction money demand, β = interest elasticity on the speculation money demand

By including equations (3), (4) and (5) in (1) we obtain the IS curve (IS1)

IS1 : r=-Y+50 (8)

By including (6) and (7) in (2) we obtain LM (LM):

LM: r=4Y-5 (9)

With (8) and (9) we find that the GDP is 11 and the in*terest rate is 39.*

If we introduce a e-bank in this model, the interest elasticity on the transaction money demand will decrease. We assume that now $\alpha = 0,6$.

In addition, with an e-bank, the customers can more easily have access to interest bearing assets. Therefore, the interest elasticity on the speculation money demand will increase. We assume that now $\beta = 0,4$.

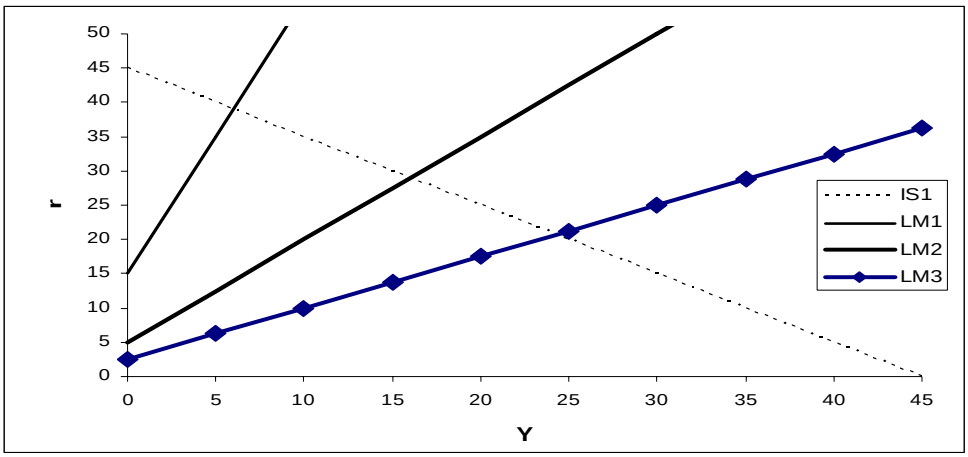
We find with theses changes in α and β that the GDP is now 21 and the interest rate is 29.

LM1: r=1,5Y-2,5 (10)

Now, we introduce the private e-money in the form of interest-bearing checkable deposits. In the standard IS-LM model, the money supply function is exogenous. Here, we add a private e-money supply function to the exogenous public money supply function.

(11) $Om = 1 + \beta r \qquad \beta = 0,4$

We find LM3: r =0,75Y-1,25 (12)



In equation (11) we assume that the public supply of money does not decrease. In fact, there is a substitution effect. If the interest rate on the private e-money increases, the private e-money will be more preferred than the public money. Consequently, the public supply of money will decrease and the private supply of money will increase.

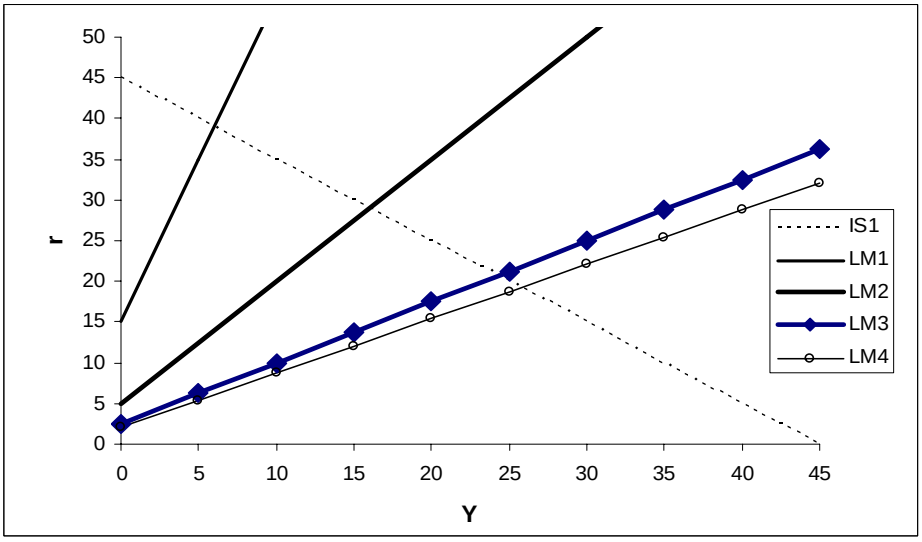
Then we illustrate the substitution effect in the equation (12)

$$Om = (1 - \alpha Y) + \beta r$$

The money market is balanced when $(1 - \alpha Y) + \beta r = \alpha Y - \beta r$

$$r = -\frac{\alpha}{\beta} Y - \frac{1}{2\beta}, \text{ with } \alpha = 0{,}4 \quad \textit{and} \quad \beta = 0{,}6$$

$$r = -\frac{2}{3} Y - 1{,}25 \qquad (LM\,4) \qquad (13)$$



A flat LM curves represent Keynes's liquidity trap in which the monetary policy is not effective. Consequently, with the development of the e-banking, the fiscal policy becomes more and more effective.

Traditionally, Central banks try to influence the households and firms pricing behaviours through interest rate, exchange rate, asset price, credit, expectations and monetarist channels. The success of Central banks monetary policies requires positive demand on government money because central banks can influence real economy mainly through interest rates. As we have seen, the government money demand decrease as a consequence of the spread of electronic money. Therefore, the real effect of central banks monetary policy weakens.

3. The emergence of new communities of e-payment users

Living in an economy where different monies coexist forces people to adapt every aspect of their economic activities to this new environment. The most routine daily transactions have to be organized differently. As explained by Heymann and Leijonhufvud

(1995), "*Money is not a refrigerator. The picture of money as a service-producing asset is incomplete without a look at transactions practices*"[5]. In the previous part, we have studied the link between the e-money – private or not – and the transactions costs. Admittedly, with the e-money the transaction costs decrease but new practices of transactions also appear. The monetary regime tends to be parcelled out by different communities of payment. By monetary regime, we adopt the Heymann-Leijonhufvud definition[6].

The economy operates with different currencies, which each one used in different types of transactions. Wages are paid in domestic money and households convert them partly in different e-monies or quasi e-monies. Different communities of payment threaten social institutions and arrangements that would exist in a united monetary regime.

The emergence of different communities of payment menaces the public character of the money. Money can be considerate as a public good. On this subject, Wieser (1927) clearly regarded money as one of the founding institutions of social economy. Money is an institution which has social responsibilities. Money ownership must follow the same rules for anyone.

With the *Digital bearer money*, networks of money users are developing apart from banks and others networks[7]. The Digital bearer money creates injustice toward those for practical, legal or financial reasons cannot access it. Moreover, a major change in the nature of money would have significant unintended consequences. For instance, the advantages for criminals and tax evaders could be considerable.

Progressively, different communities of e-payment are setting up. For the moment, the footbridges between the various communities do not exist. Nevertheless, it is enlightening to make a comparison between Smiles and Maximiles.

Smiles or Maximiles are like points, much as the airlines' frequent flyer miles. They are now used as rewards for visiting hundreds web sites. But as more sites are added, these points tend to become world's virtual currency on the internet and can be assimilated as Digital bearer money.

Regarding to the Maximiles provider, it is possible to obtain Maximiles without using euros. More you are visiting or buying good or services on the Maximiles online network, more you obtain Maximiles. You can also buy Maximiles online for buying goods or services only available in the Maximiles' shop network. It becomes possible to estimate an exchange rate between the Euro and the Maximiles. At the present time the EUR/Maximiles exchange rate is 0,02, i.e. with 1 euro, you can buy online 50 maximiles.

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[5] See page 85 of Heymann Leijonhufvud (1995).

[6] « By a policy regime, we mean, on the one hand, a system of expectations on the part of the public that governs their decision and, on the other, that pattern of behaviour on the part of the policy-making authorities that sustains these expectations. The monetary regimes forms a crucial part of the environment in which both the public and the authorities have to make their decisions.» (p.39)

[7] Digital bearer money is like cash and can be transferred person-to-person without going through a bank or PayPal account.

By comparison with an other quasi-money network called Smiles, even if it is impossible to buy directly Smiles with euro, we can estimate that the exchange rate Smiles/Maximiles is 0,55 i.e with 1 euro, you can have nearly twice more Smiles than Maximiles (see Annex 3)[8].

We can observe that the exchange rate between the Euro and a private quasi-money - like Smiles - is different according the different goods or services. It is more profitable to buy a Café that to buy Petrol with Smiles. Such a difference of Exchange rate is due to the actual impossibility for the consumer make a rational evaluation of the Euro/Smiles Exchange rate. The consumer can just compare Smiles with goods or services and not with the public money. For instance, with perfect information the consumers would never buy Petrol in a French Shell Station.

Even if it is not possible at the present time, we could assume a potential link between both Smiles and Maximiles networks. For instance, with 5.5€, we buy one ticket of cinema in the Smiles network then we exchange this ticket in the Maximiles network for 1000 Maximiles because the same ticket worth 1000 Maximiles. For acquiring 1000 Maximiles in the Maximiles website you must give 20 euros. Therefore with 5.5€ in the Smiles network, you could have 20€ in the Maximiles network i.e. 20€ profit.

Admittedly, gaining such a profit is not possible at the present time but if the quasi-private monies will spread in a near future, a harmonisation of the different exchange rate should appear.

The communities of both Paypal banking services and Linden Dollars users are growing very fast. The first consequence we have shown in the previous part results in the decrease in demand for central banks and consequently the decrease of central bank seigniorage revenue (Rahn 2000, p.3). The central banks make large income from issuing paper banknotes, which are non-interest bearing central banks liabilities. The decrease of seigniorage revenues may cause that central banks can not cover their operation costs. As seigniorage revenues are one of the most significant income sources of national treasury at the same time, it can be also stated that there will be a decrease in the income of treasury.

Among the various e-money networks communities, the Linden Dollars case is specific and raises new questions. Traditionally, games worlds are completely distinct from the real world. In Second Life, a virtual world, many virtual objects - like ideas, software, surveys - bought or sold during the game by virtual avatars are directly marketable in the real world. For instance, it is possible to make and enquiry, an opinion pool or any marketing test in the Second Life World and selling in central money the results of these surveys in the real world. Nowadays, most of the biggest international firms are active in Second Life. The borders

[8] http://www.smiles.fr/

between the Second Life virtual world and the real world are increasingly fuzzy. On an economic point of view, this opacity complicates the rational calculus of the price vector. In the general neoclassical theory inherited of Walras, Jevons and Menger, the fixation on a price rely on the private utility. In Second Life, the players buy or sell virtual objects at a price based on ostentatious criteria. For instance, you do not buy a virtual coat with linden dollars to avoid a cold in winter but for showing yourself and showing your richness in Linden Dollars. Therefore, goods have not a private utility for agents but a social utility.

The works of Veblen (1899) are helpful to understand the price determination mechanisms in Second life world. Veblen argues that economic life is driven not by notions of utility. He defined conspicuous consumption as the waste of money by people to display a higher status than others. For Veblen, the conspicuous leisure is a waste of time by people to give themselves higher status. He asserts that humans are not rational, utility-seeking people who try to maximize their pleasure but are completely irrational creatures that run after social status. Reading Veblen works by taking into consideration what occurs in Second life is very enlightening. In the virtual world of Second Life, the different communities of users behave with an *emulation* attitude[9]. The avatars attempt to mimic the more respected members of their group in order to gain more status for themselves[10]. Moreover, the emulation attitude modifies the mechanism of price determination. In Second Life, many goods are *Veblen goods*[11]. For instance, decreasing the price of the land *decreases* people's preference for buying it because it is no longer perceived as exclusive or high status products.

4. Conclusion

The communities of electronic money users are communities of practice which adopts specific decisions, routines and behaviours. These communities can temporarily move away from the official monetary regime regulated by central banks.

Moreover, the classical analysis of price setting behaviour based on the private utility maximisation rule is somewhat unsuited. With e-monies, publics or privates, the monetary policy becomes less effective. Quasi e-monies like Smiles, Maximiles or Linden Dollars provide socially useful services. The central banks should not prevent them to fulfil their social missions. However, central banks should integrate them in the official interbank system both for fiscal reasons and to protect the lawful aspect of the money. Money must not generate exclusion. All the economic agents must have access to all type of goods and all the virtual shopping centres.

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[9] The term « emulation » is proposed by Veblen to illustrate the permanent run after the social status.
[10] Such a mimetic process can be studied by using the institutional isomorphic change described by DiMaggio and Powel (1983).
[11] Commodities are *Veblen goods* if people's preference for buying them increases as a direct function of their price.

Annex 1: Instructions for remaining an anonymous paypal user

Open a personal account. It is possible to choose a wrong country of origin for spreading confusion. For example, we choose to tell Paypal that we are from the Netherlands Antilles.

PayPal Account Owner Contact Infomation. It is possible to give a wrong identity. We give here the following informations.

First Name: Adam

Last name: Smith

Adress: invisible hand str.

City: Willemstad

Primary currency : euros

e-mail address **:** smithadam1776@yahoo.fr

Add Credit Card or Debit Card. It is possible to not give a credit card number and therefore being for Paypal an unverified account.

The experience is the following.

We created two paypal accounts anonymously. The first one, namely hueber@free.fr, is located in France. The second one, namely smithadam1776@yahoo.fr is located in the favourable taxation regime of the Netherlands Antilles. Both bank accounts are in euro currency.

Step one: On Ebay.com, by using the hueber@free.fr paypal account, we sold a book of 10, 00€. PayPal charged the buyer's credit card and instantly credited the hueber@free.fr PayPal account. The buyer is not anonymous. Selling a good or a service is the only way to add funds anonymously on a paypal account. The other possibility is none anonymously to use a credit card to add funds.

On this transaction, paypal took a commission and it remained on the hueber@free.fr account 9,89€.

Step two: From the hueber@free.fr account, we transferred the 9,89€ to the smithadam1776@yahoo.fr Paypal account. The transaction was not accepted by Paypal because the Netherlands Antilles cannot receive money from Paypal.

Step Three: From the hueber@free.fr account, we transferred the 9,89€ to the tveblen1899@yahoo.fr Paypal account located in the United States.

Conclusion: With Paypal, it is possible to transfer money anonymously abroad. It is also possible to create and transfer abroad thousand Paypal accounts, each of them credited of 1500€.

Annex 2: Creation and circulation of the Private quasi e-money

Let us suppose a simple interbank system with three banks i.e. one Central Bank, one Commercial bank and one e-bank. The e-bank is a private company apart from the institutional banking system and issuing e-money buy receiving in exchange the legal currency. The central bank imposes on the commercial bank the obligation to keep an obligatory reserve. The obligatory reserve is part of the money on bank accounts, the money from the sale of securities or other sources. The e-bank does not have deposit reserves on the Central bank. In the following example, we assume that the obligatory reserve norm is 10% of deposits and that the refinancing rate i.e. discount rate is 5%. In the first period, with an accounting perspective, the interbank system can be represented by the following three bank T-accounts.

Period 1: The commercial bank creates 100 euros to one of its customer and such a creation cost to the commercial bank 0,5 cents (5%×10€)

Central Bank

Assets		Liabilities	
Loan to Commercial Bank	10	Legal Reserve	10

Commercial Bank

Assets		Liabilities	
Loans	100	Deposit Account	100
Legal Reserve	10	Borrowing from the Central Bank	10

e-bank

Assets		Liabilities	

Period 2: The customer of the commercial bank decide to transfer all the 100€ created for him to the e-bank. The legal money move out from the legal interbank system. This transfer is costly for both the Central bank which lose its 0.5€ earned in period one and for the commercial bank which must pay banking fee to the e-bank. For instance, the Paypal bank ask for 3% of the amount of money transferred as banking fee.

Central Bank

Assets		Liabilities	
Loan to Commercial Bank	0	Legal Reserve	0

Commercial Bank

Assets		Liabilities	
Loans	100	Deposit Account	0
Legal Reserve	0	Debt to the e-bank	100

e-bank

Assets		Liabilities	
Credit from the Commercial Bank	100	Deposit Account	100

Period 3: The e-bank converts the 50€ into 2500 units of its private unit of account.

For instance, with 100€, it is possible to buy 500 maximiles[12]. The Maximiles cannot be qualified as real private e-money because it is only possible to use Maximiles in the Maximiles' online store network. Nevertheless, the Maximiles network is so large that Maximiles can be assimilated as private quasi-money. Our three T-accounts are the following:

Central Bank

Assets		Liabilities	
Loan to Commercial Bank	0	Legal Reserve	0

Commercial Bank

Assets		Liabilities	
Loans	100	Deposit Account	0
Legal Reserve	0	Debt to the e-bank	100

e-bank

Assets		Liabilities	
Credit from the Commercial Bank	100	Deposit Account	50
		e-money in € (i.e. 2500 private e-money units)	50

The 2500 quasi-money units privately issued can circulate on the internet network apart from the euro monetary regime. Therefore, the main effect of the private e-banking is a permanent decrease in money demand.

[12] http://www.maximiles.com

Annex 3: Exchange rate between two private quasi-monies

Euros	smiles	EUR/S'miles	S'miles/EUR	Exemple
10	800	0,0125	80	voucher of 10 euros valuable in any French Casino supermarket
5	500	0,0100	100	voucher of 5 euros valuable in any French shell petrol station
15	1500	0,0100	100	voucher of 15 euros valuable in a bank account deposit of the Caisse d'Epargne
35	3500	0,0100	100	Voucher of 35 euros valuable for buying banking services of the Caisse d'Epargne
3	30	0,1000	10	four cafés valuable in any French Casino restaurant
3	30	0,1000	10	discount of 3 euros valuable in any French Casino restaurant

Euros	Maximiles	EUR/maximiles	Maximiles/EUR	
10	500	0,0200	50	It is possible to buy directly maximiles online

Maximiles	S'miles	Products	S'Miles/Maximiles	euros
1000	550	1 ticket of cinema with "cinéchèque"	0,55	
50	100	1 euro	2	1

Conclusion: With 1 euro, we can have twice more S'miles than Maximiles

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